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ABSTRACT

The Kentucky Council on Higher Education used a federal grant to develop a statewide articulation system in six allied health disciplines, one of which is the Clinical Laboratory Sciences. An in-depth study of admissions procedures, transfer policies, and curricula at the eight state-supported higher education institutions as well as private, proprietary, and vocational-technical schools in the state was conducted. Transfer policy statements and mechanisms for converting credit hours are charted for each institution. Courses were grouped in seven categories, clock-hour averages were compared for the categories, and recommendations were made for structuring programs according to need for courses. The model articulated curriculum, to be adapted to each institution's needs, is charted and allows for articulation of clinical laboratory science courses at three program levels: one-year, two-year, and four-year programs. An ongoing articulation effort is recommended that would have three phases: (1) dissemination of information gathered and compiled in the study, (2) establishment of a central articulation information and coordination clearinghouse, and (3) articulation implementation and maintenance, with feedback to the second coordination phase. (MSE)

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Kentucky Articulation Project in Clinical Laboratory Sciences

Presented
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U. S. Department of Health and Human Services, Public Health Service, Health Resources Administration, Bureau for Health Professions Grant # 5 D12 AH 90062-03.

ABSTRACT

The Kentucky Council on Higher Education was awarded a grant by the U.S. Department of Health Education and Welfare to develop a statewide system of articulation in six allied health disciplines, one of which is the Clinical Laboratory Sciences. An in-depth study of admissions procedures, transfer policies and curricula at the eight state supported higher education institutions as well as private, proprietary and vocational-technical schools was conducted. The results of these studies led to the development of an articulation model for the State of Kentucky which can be used by interested colleges and universities in other states as well.

INTRODUCTION

During the past few decades there has been a dramatic increase in the number of health practitioners prepared at different educational levels. In the clinical laboratory science field, practitioners have been prepared at three recognized educational levels. When a person with one or two years of preparation has desired to advance in their field they have found few available mechanisms for career advancement through recognition of previous education or work experience.

In the spring of 1979 the Council on Higher Education initiated a funded project designed to address the problems encountered by health practitioners who sought upward mobility through educational programs at colleges and universities. The project called for the development of an articulation model for career mobility in the education of practitioners in six allied health fields.

In addition to the clinical laboratory sciences, the other disciplines include: Dental Auxiliaries, Dietetics/Nutrition, Radiological Sciences, Respiratory Threrapy and Rehabilitation Therapy.

As you know, graduates of one or two year clinical laboratory science

programs (MLT-C and MLT-AD) who wish to move to the next level have problems with the translation of their technical courses for transfer credit. As a result students may be required to spend an additional year or more taking prerequisities or repeating courses to meet program requirements.

This has understandably lead to students seeking other avenues to circument this problem.

Both the American Socity for Clinical Pathology Board of Registry and the National Certification Agency for Medical Laboratory Personnel have developed alternative routes for clinical laboratory personnel to meet certification requirements. These may well be the most accessible route for career mobility for the MLT-C and MLT-AD who have completed a B.S. and acquired acceptable work experience. Students who have followed these alternative routes to MT certification have most likely held full time jobs while completing the baccalaureate degree. They have probably studied theory and principles of more advanced clinical subjects independentely in order to pass the certification examination. Their work experience has had no educational structure and is therfore not likely to encompass the variety of test procedures included in the traditional

MT educational program. As employees they have not had the advisor nor guidance person available to students, and it is probable that the evaluation of the quality of their work has not been as critical as it might be in an educational program. The consequence of permitting individuals to pursue the alternative routes could be less assurance of the best quality in patient care.

The purpose of KAHP is to develop mechanisms for teansfer of academic/professional/technical competencies to the next level with minimal loss of credit by the student. This would be encompassed in an articulation model developed by Discipline Advisory Groups or DAG. The Clinical Laboratory Sciences DAG has a composition similar to that of the other disciplines:

Public Colleges and Universities:

1) UK Community College System:

Jane Edwards
Henderson Community College MLT Program

2) Eastern Kentucky University

Dick Schmitt - Medical Technology Program

3) Kentucky State University

Dr. Gertrude Ridgel - Chairman Division of Biological Science

4. Morehead State University

Ted Pass II, Pre Medical Technology Advisor

5. Murray State University

   Cathy Christopher, MLT Education Coordinator

6. Northern Kentucky University

   Dr. Earl Raps, Chairman Nursing & Allied Health

7. University of Kentucky

   Dr. Marie Vittetoe, Chairman, Dept. of Medical Technology

8. University of Louisville

   Helen Layman, Medical Technology, Program Director

9. Western Kentucky University

   Mr. Michael Rush, Medical Technology Coordinator

Private Colleges and Universities

1. Sr. Mary Laurence Budde, Chairman
   Biology Department, Medical Technology Advisor

Vocational Schools

Donna Harrison
CLA Program Director
Madisonville State Vocational-Technical School

Proprietary Schools

Sonya Hopkins
Director, Allied Health Programs
Watterson College

Hospital Based Programs

Patricia Motley
Education/Personnel Coordinator,
International Clinical Laboratory

KSSMT Representative

Robert Eich
Laboratory Manager, The Medical Center
Bowling Green

The CLS advisory group identified three major areas for study. The group decided to break into three subcommittees to study admissions policies, curriculum and related competencies, and transfer policies. After collecting the necessary data, the information was to be collated and an articulation moedl developed by a fourth sbucommittee.

Kentucky Articulation Project In Clinical Laboratory Sciences

Transfer Subcommittee Report
June 1981

Prepared by Marie Vittetoe Ed.D.

The transfer subcommittee of the Clinical Laboratory Sciences Discipline Advisory Group had the following goals:

1. to determine what transfer policies/mechanisms were in place
2. to compile data gathered
3. to recommend further action regarding transfer procedures

A transfer of credit survey form was developed which consisted of questions which were developed to identify available mechanisms for granting academic credit to incoming students for previous instruction and experience specific to CLS programs.

The first part of the survey was in chart form to check and/or explain responses to the following questions:

1. Can academic credit be granted for transfer of courses taken elsewhere, such as from military, university, or community college programs.
2. Can credit be granted for experience gained in military, vocational-technical, proprietary or other settings?
3. Can credit be granted to equivalency, proficiency or national registration, certification, licensure or any other type of credit?

The second part of the survey form was customized for each CLS program. That is, courses were listed for each individual program and the following questions were asked of respective program respondents:

1. Can non-traditional experiences and learning be evaluated?
2. Can these be converted into credit hours? If yes, how is this done?
3. Can credit be given for satisfactory scores on CLEP "general examinations?" If so, will grades or quality points be given?

Some questions from the Allied Health Program Admission Form related to the transfer process. These questions were:

1. How many transfer students have you accepted in 1978-79?
2. From which and to which institutions have students from your program transferred?
3. Can you award credit for advanced Placement (AP), previous training or work experience or challenge examinations?

EXISTING TRANSFER POLICIES AT COLLEGE MT AND MLT-AD PROGRAMS

The responses from 24 institutions and/or programs for CLS regarding the transfer of competencies showed some differences in transfer policies.

Military Experience

Fourteen respondents from MT programs and one respondent from MLT programs indicated that mechanisms exist for converting educational experience and instruction from military training or experience into credit hours. A formal mechanism for transcript evaluation of military training is available through the Community College of the Air Force in Texas or through the "Guide to the Evaluation of Educational Experiences in the Armed Forces" published by the American Council on Education.

Vocational-Technical Experience/Proprietary Schools

Mechanisms to convert vocational-technical experience into credit hours were reported in ten MT and in two MLT-AD programs; proprietary school experience in eight MT and one MLT-AD programs; and other experience in nine MT and one MLT-AD programs. Information on military, vocational and proprietary school experience is summarized in Table 4.

Credit for CLEP/ACT/AP/Proficiency Examinations

Respondents from sixteen MT and six MLT-AD programs indicated that credit is allowed for satisfactory scores on CLEP general examinations. Respondents from ten MT programs and one MLT program indicated that credit is allowed for CLEP subject matter examinations. Responses from seven MT programs and three MLT-AD programs indicated that allowance is made for high ACT scores. Responses from thirteen MT programs recognized advanced placement

TABLE 4

MECHANISMS AVAILABLE FOR CONVERTING INTO CREDIT HOURS

PROGRAM LEVEL	MILITARY	VOC-TECH	PROP. SCHOOL	OTHER
MT PROGRAMS				
Asbury College	+	+	+	+
Bellarmine College	-	-	-	-
Brescia College	+	+	-	-
Campbellsville College	+	-	-	-
Cumberland College	+	+	+	+
Eastern Kentucky University	+	-	-	-
Georgetown College	-	-	-	-
Kentucky State University	+	-	-	-
Kentucky Wesleyan College	+	-	-	-
Morehead State University	+	+	+	+
Murray State University	+	+	+	+
Northern Kentucky University	+	-	-	-
Pikeville College	+	+	+	+
Spalding College	-	-	-	-
Thomas More College	-	+	-	+
University of Kentucky	+	+	+	+
University of Louisville	+	+	+	+
Western Kentucky University	+	+	+	+
MLT PROGRAMS				
Eastern Kentucky University	+	-	-	-
Henderson Community College	-	-	-	-
Jefferson Community	-	-	-	-
Somerset Community College	-	-	-	-
Southeast Community College	-	+	-	-
Watterson College	-	+	+	+

scores as a mechanism to earn credit. Respondents from fifteen MT and three MLT-AD programs stated that credit was awarded for departmental proficiency examinations. Respondents from two MT programs said that automatic credit was given for credentials such as MLT-C and MLT-AD.

The respondents possibly interpreted the question to mean that the allowance for CLEP general examinations, high ACT scores, and advanced placement scores were used to reduce the number of prerequisite courses rather than substituting proficiency examinations for MT/MLT courses. (See Table 5.)

All MT and MLT-AD program respondents indicated that conversion to credit hours referred to general education requirements. In ten MT and four MLT-AD programs conversion of credit hours in the student's major field was also allowed (Table 6).

Since ten of the eighteen respondents from MT programs indicated they would accept the scores from CLEP subject matter examinations for credit, the transfer committee requested that the CLS-DAG members review the subject-related examinations, such as clinical microbiology, hematology, etc. The consensus of opinion was that these examinations were out-dated.

Existing Transfer Policies at Hospital-Based Programs

Respondents from Kentucky schools and four out-of-state schools indicated that mechanisms are available for converting educational experiences and instruction from MLT-C, MLT-AD, military or other experiences into credit hours. Respondents from two MT programs said the student time was shortened or altered according to students' experiences. None of the hospital-based MT program respondents indicated that they would give automatic credit for MLT-C,

TABLE 5

MECHANISM AVAILIABLE FOR CONVERTING INTO CREDIT HOURS

PROGRAM	CLEP. GEN EXAM	CLEP. SUBJ MATTER	ACT	APP	DEPT. PROF EXAM	CERT. CREDIT	OT
MT							
Asbury College	-	+	+	+	+	-	-
Bellarmine College	+	+	-	+	+	-	-
Brescia College	-	+	-	-	+	-	-
Campbellsville College	+	+	+	-	+	-	-
Cumberland College	+	+	+	+	+	-	-
Eastern Kentucky University	+	-	-	-	-	-	-
Georgetown College	-	+	-	-	+	-	-
Kentucky State University	+	-	+		-	-	-
Kentucky Wesleyan College	+	+	-	+	+	-	-
Morehead State University	+	-	+	+	+	-	-
Murray State University	+	-	+	-	+	+	-
Northern Kentucky University	+	-	-	+	-	-	+
Pikeville College	+	+	-	+	+	-	-
Spalding College	+	+	-	+	+	-	-
Thomas More College	+	-	-	+	+	+	+
University of Kentucky	+	-	-	+	+	-	-
University of Louisville	+	+	-	+	+	+	-
Western Kentucky University	+	-	+	+	+	-	-
MLT PROGRAMS							
Eastern Kentucky University	+	-	-	-	-	-	-
Henderson Community College	+	-	-	-	+	-	-
Jefferson Community College	+	-	+		-	-	-
Somerset Community College	+	-	+	-	+	-	-
Southeast Community College	+	-	+	-	-	-	-
Watterson College	+						

TABLE 6

AVAILABILITY OF MECHANISM FOR CONVERTING EDUCATIONAL EXPERIENCES INTO CREDIT HOURS WHICH ARE REQUIREMENTS FOR GENERAL EDUCATION OR MAJOR

PROGRAM	GENERAL EDUCATION	MAJOR	MINOR
	MT PROGRAMS		
Asbury College	+	-	N/A
Bellarmine College	+	-	N/A
Brescia College	+	-	N/A
Campbellsville College	+	-	N/A
Cumberland College	+	+	N/A
Eastern Kentucky University	+	+	+
Georgetown College	+	-	N/A
Kentucky State University	+	+	N/A
Kentucky Wesleyan College	+	-	N/A
Morehead State University	+	+	N/A
Murray State University	+	+	-
Northern Kentucky University	+	+	N/A
Pikeville College	+	+	N/A
Spalding College	+		
Thomas More College	+	+	N/A
University of Kentucky	+	+	+
University of Louisville	+	+	+
Western Kentucky University	+	-	-
	MLT PROGRAMS		
Eastern Kentucky University	+	+	-
Henderson Community College	+	+	-
Jefferson Community	+	-	-
Somerset Community College	+	-	-
Southeast Community College	+	-	-

MLT-AD or MT Certification. However, hospital-based programs could seek such credit from their respective academic institutions. That such mechanisms exist is evident from the fact that fifteen out of the eighteen responses from academic institutions indicated that departmental proficiency examinations were available. And in the case of previous certification, these proficiency examinations would be appropriate validation mechanisms. This information is summarized in Table 7.

Five of the twenty-one MT programs responding had accepted a total of nineteen transfer students with previous CLS educational experience during the last five years (1974-79). In Table 3 the data from the five institutions which accepted transfers are shown. Two of these responses were from institutions which had both MLT(AD) and MT programs; eleven of the nineteen transfers occurred within those programs. The remaining five schools had accepted a total of eight transfer students during the last five years. The results showed that a small number of students with previous CLS background transferred to MT programs. The respondents were not asked to specify the exact manner in which the transfer process took place, the amount of credit given for previous experience, nor the number who successfully completed the programs.

RECOMMENDATIONS

Encourage development of transfer mechanisms according to models proposed in this study.

a. Transfer Agreements

b. Military Credit

c. Proprietary School Credit

d. Experiential Learning

TABLE 7

HOSPITAL BASED PROGRAMS (ASSOCIATED WITH KENTUCKY COLLEGES) WITH MECHANISM AVAILABLE FOR GIVING CREDIT FOR PREVIOUS EDUCATIONAL INSTRUCTION AND EXPERIENCE [IN] CREDIT HOURS.

PROGRAM LEVEL	MLT-C	MLT-AD	MILITARY	OTHER
Pikeville Methodist (Ky)	-	-	-	-
Beckly ARH (W.Va)	-	-	-	-
St. Joseph (Ky)	-	-	-	-
St. Elizabeth (Ky)	+	+	+	+
Providence (Ky)	+	+	+	+
Vanderbilt (Tn)	+	+	+	+
Nashville Baptist (Tn)	+	+	+	+
St. Thomas (Tn)	+	+	+	+
Lourdes (Ky)	+	+	+	+
St. Mary (Ind)	-	-	-	-
Owensboro-Daviess Co. (Ky)	-	-	-	-
St. Anthony (Ky)	-	-	-	-
Cumberland (Tn)	+	+	+	+
St. Mary and Elizabeth (Ky)	-	-	-	-

+: indicates mechanism available
-: indicates no mechanism available

TABLE 8

NUMBER OF MLT-C or MLT-AD TRANSFERS TO

COLLEGIATE MEDICAL TECHNOLOGY PROGRAMS

DURING FIVE YEAR PERIOD 1974-1979

Name of Program	# of Transfers
Eastern Kentucky University	3
Murray State University	8
Thomas More College	2
University of Kentucky	4
University of Louisville	2

A. Sample transfer agreements were developed for this study to serve as models for other institutions' use in developing their own transfer agreement(s) among or between institutions offering CLS programs:

MLT-C ⟶ MLT-AD
MLT-C ⟶ MT
MLT-AD ⟶ MT

B. Military credit should be transferred according to the "Guide to the Evaluation of Educational Experiences in the Armed Forces" by the American Council on Education. This Guide offers a national standard for the acceptance of military credit and/or experience. Oftentimes transcripts are available from the Community College of the Air Force in San Antonio, Texas.

C. Transfer of proprietary school credit will be based on the regional accreditation held by the proprietary school. Transfer of laboratory course credit from proprietary schools will be dependent upon the judgement of the independent MLT and MT faculty as to the equivalence of the courses that have been taken in the proprietary program. The specific problems of transferability may be addressed by the development of proficiency examinations through which the student might test out. The student would be aware of these potential transfer arrangements when investigating the possibility of transfering to a program at the next level.

D. Experiential learning differs significantly from person to person. A very individualized approach must be used in awarding credit because different people have worked in different departments at various levels. Thus it is critical that the person's experiences be evaluated through use of:

a. supervisor's input

b. the individual's input

c. possible use of proficiency examinations.

The extent to which experiential learning can be awarded credit is also dependent upon each institution's transfer policy.

It is feasible that clinical experience could be adjusted in the case of a student's clinical rotations. This type of adjustment should be easily administered, as in the case of a check list, for determining whether or not the person met the minimum number of tests performed, and the level at which they were performed. The more difficult process of trying to determining the amount of credit to be given per academic experience is a matter in which the proficiency examination or competency examinations would be more appropriate. In the opinion of the CLS Discipline Advisory Group it would be difficult to standardize this award of credit for experiential learning (life experiences), since different programs have different mechanisms for awarding credit and for which there appear to be no standardized format(s). For these programs which are modularized or have capability of awarding varying credit, it is feasible that part of a course could be proficiencied out, while other parts of the course were taken for full credit.

Although some institutions have been awarding credit for experiential learning, others have been holding back on credit for experiential learning. The reader is referred to the bibliography for references which provide information on the experience of other institutions in granting credit for experiential learning.

The DAG recommends that persons transferring from one program to another be given all the credit possible using all available mechanisms. Only in this manner can full recognition be given for the various components of a person's background and experience.

4. Promote curriculum development and/or revisions based upon the objectives and competencies identified in this study.

   A. Competencies and Objectives

      1. CLS educators interested in articulation could use the accepted competency statements of the ASMT and the laddered objectives developed and validated by the DAG to clarify specific differences in MLT and MT career entry competencies.

      2. Faculty of all CLS programs should be encouraged to prepare check lists or thorough descriptions of minimal competencies expected upon completion of courses to assist in determining specific differences between levels.

   B. Competency and Proficiency Exams

      Individuals interested in articulation should promote the development and validation of CLS competency and proficiency examinations or other mechanisms to award credit for clinical experience.

      1. Faculty in institutions in which challenge exams have been developed should evaluate periodically the exams and processes for awarding credit and identify components for refinement and expanded use.

      2. Information concerning mechanisms which have been developed should be shared with other CLS programs through a central information center.

3. Faculty in institutions which currently lack systems for articulation should be encouraged to develop examinations or other mechanisms to facilitate award of credit for clinical experience.

4. To provide for academic and institutional freedom and innovation, CLS programs should be allowed to develop independent systems for awarding credit for previous experience. Rather than utilizing standardized tests, faculty should have the priviledge of assessing student competency in a manner acceptable to the faculty.

5. The use of CLEP examinations on specific CLS subject matter should be discouraged because they are out of date.

Appendix J

Suggested Format for

CONDITION OF AGREEMENT FOR TRANSFER OF CREDIT
FROM THE _____ AREA VOCATIONAL SCHOOL TO
THE _____ MEDICAL TECHNOLOGY PROGRAM

GENERAL REQUIREMENTS:

1. No transfer credit will be accepted or entered on a student's transcript at the _____unless that student has successfully completed the courses or programs at the _____Area Vocation School. However, at the appropriate time the transfer of credit will be entered on the student's _____University transcript as having been completed at the _____Area Vocational School and as having met the various course requirements as enumerated in this document.

2. Students will be selected for acceptance in the Medical Technology Program at the _____on a competitive basis according to the selective admissions process of the program. If the student is admitted to the program and the student's appropriate course work was completed with a grade of A or B, the courses will be accepted in lieu of University courses as specified herein. If the course work was completed with a grade of C or below, a proficiency test may be taken. If the proficiency test cannot be passed, the course must be repeated.

3. Students must earn a minimum of 30 hours of credit at the _____ _____. They must complete a minimum of 30 hours of credit from the Medical Technology Program, regardless of the number of hours transferred or proficienced.

SPECIFIC REQUIREMENTS IN MEDICAL TECHNOLOGY:

The _____will accept transfer credit from the _____ Area Vocational School Laboratory Assistant Program for _____courses as follows:

_____	Laboratory Methodology I (Urinalysis)	____ credits
_____	Laboratory Methodology II (Clinical Chemistry)	____ credits
_____	Laboratory Methodology III (Clinical Hematology)	____ credits
_____	Laboratory Methodology IV (Introduction to Blood Banking and Immunohematology	____ credits
_____	Blood Collection	____ credits
	TOTAL	credits

In addition a student may proficiency any other course in the Medical Technology Professional Program. A student may also be exempt from portions of the_____ Clinical Practicum by virtue of work experience. Each student will be considered individually in this regard and will be expected to provide evidence from supervisors who are familiar with the quality and quantity of clinical experiences.

The total of ____ credits will be held in escrow until the student has successfully completed the Medical Technology Program. At that time the courses will be added to the _____transcript as partial degree and program completion requirements.

_____ _____
President Date

_____ _____
Director Date

Appendix J

Suggested Format for

CONDITION OF AGREEMENT FOR TRANSFER OF CREDIT
FROM THE MEDICAL LABORATORY TECHNICIAN PROGRAM AT
THE _____ COMMUNITY COLLEGE TO
THE _____ MEDICAL TECHNOLOGY PROGRAM

GENERAL REQUIREMENTS

In general, students enrolled in the _____ Community College are eligible to transfer to the _____ campus provided that they are not under suspension or financially delinquent.

All courses taken at the community college campus are transferred with credit, grades, and quality points; however, _____ decides which credits apply to the degree requirements in the Medical Technology Program.

No transfer credit will be given until the student is accepted into the Medical Technology Program through the selective admissions process. If the student is admitted to the program and the student's appropriate technical course work was completed with a grade A or B, the courses designated will be accepted in lieu of specific University courses as previously arranged and as specified in this document. If the course work was completed with a grade of C or below, a proficiency test may be taken. If the proficiency test cannot be passed, the course must be repeated at the University.

Students must earn a minimum of 30 hours of credit at the _____. (College transferring) They must complete a minimum of 30 hours of credit from the Medical Technology Program, regardless of the number of hours transferred or proficienced.

SPECIAL REQUIREMENTS IN MEDICAL TECHNOLOGY

The _____ will accept transfer credit from the _____ Community College Medical Laboratory Technician Program as follows:

FIRST YEAR	Crs.	SECOND YEAR	
Freshman Composition I or	3	General Psychology	
Composition for Technical Students I	(3)	Hematology I	
Elementary Anatomy	3	Clinical Chemistry I	
Introduction to the Clinical Laboratory	3	Applied Clinical Microbiology I	
General College Chemistry I	3	Elective	
General Chemistry Laboratory I	2		
Approved Elective	3		
	17		
Freshman Composition II	3	Clinical Chemistry II	
Composition for Technical Students II	(3)	Blood Bank	
Elementary Physiology	3	Applied Clinical Microbiology II	
General Microbiology/or equivalent	4	Hematology II	
Routine Analysis	2		
General College Chemistry II	3		
General Chemistry Laboratory II	2		

The University Registrar will judge the general courses. The Department of Medical Technology will accept courses as follows:

In addition a student may proficiency any other course in the medical technology professional program. A student may also be exempted from portions of the Clinical Practicum by virtue of work experience. Each student will be considered individually in this regard and will be expected to provide evidence from supervisors who are familiar with the quality and quantity of clinical experiences.

The total of _____credits will be held in escrow until the student has successfully completed the Medical Technology Program. At that time the courses will be added to the _____transcript as partial degree and program completion requirement.

_____ _____

President Date

_____ _____

Director Date

DAG CLINICAL SCIENCES ADMISSIONS SUBCOMMITTEE

The charge to the Admissions Subcommittee of the Discipline Advisory Group was we "Agree on basic admission criteria and procedures for each level of program".

The Allied Health Program Admission Form was adapted from an instrument developed by Dr. Marie C. Dietric, Assistant Dean for Curriculum Planning, Development and Research, College of Medicine and Dentistry of New Jersey, Newark, N.J.

The respondents to our survey were: One certificate medical laboratory technician program, five Associate Degree medical laboratory technician programs, one Bachelor Degree 2+2 program, ten Bachelor Degree 3+1 programs, two Bachelor Dgree generic programs, and three hospital-based programs. These programs are all located in Kentucky.

Findings: All of the programs either were accredited or in the process of being accredited by NAACLS.

The commonalities on which basic admission criteria and procedures could be established for each level of program were few, but there were some. Under academic records on page three of the survey form, G.P.A.s and Class Standing were used by the majority of programs at all levels. Under College Records, Total G.P.A., Total Credit Hours, and the Percentile Rank; these criteria were important to being admitted to the medical technology and the medical laboratory technician programs.

Considering test scores as admission criteria, still on page three, the American College Test Battery (ACT) was used by both MLT and MT programs. The hospital-based programs did not use test scores.

Page five: Demographic information was of value to the state supported schools offering MT programs and the hospital-based programs. The MlT programs were not too concerned about residency. Interviews were used by all the programs responding. A standard form was preferred by

by most programs and the Program Director and the Program Admission/Selection Committee were the responsible parties for the interview. Letters of Recommendation were requested by 15 of the 22 programs responding. The most important source of that letter was the Department Chairman in whose program the applicant was enrolled.

Page six: Selection Process. This section concerns the sources of information available to the applicant about each component part of the program selection process. This area is probably the weakest element of our system as it existed at the time of the survey. The majority of the applicants received information by oral means. The brochure was a secondary choice and the College Catalog ranked as the least important source of information. I would like to refer you to the Principles of Good Practice in Admissions from "Bakke: The Unfinished Agenda in Admissions".* This is a list of ten items concerning vital information to the applicant about the selection process which we tried to elicit in this survey. The majority of the responses stated that these criteria did not apply to them or that no information was provided. Program Selection Committee: All but one of the respondents utilize a program selection committee. Their precise function could not be ascertained from the data. The committees perform such diverse activities that no pattern developed which could be considered a commonality. Non-collegiate learning was accepted by one MLT program.

Page eight. Alternate lists were prepared and used by all hospital-based programs, four universities and colleges, and three junior college MLT programs. Final Student Selection section developed no predominant pattern.

RECOMMENDATIONS:

1. Disseminate information concerning commonalities in student selection procedures to eliminate duplication on the part of the transfer student.

2. Notify advisors of:
   Updated insitutional policies relating to student selection criteria quantitative standards such as G.P.A. and test scores necessary for admissions. Fees and costs should be included in the notification.

3. Deadlines for application, dates for notification of acceptance or rejection should be published.

4. Program information such as the number of enrollments per year, beginning dates for classes, and clinical laboratory sciences curricular components within which part-time students might participate in should be published.

* PRINCIPLES OF GOOD PRACTICE IN ADMISSIONS
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Washington, D.C. 20036

Admissions Subcommittee to the DAG CLS

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CURRICULUM SURVEY STUDY

The Curriculum Subcommittee was charged with developing a model curriculum to enable students to move from the technician level to the technologist level of preparation in the clinical laboratory sciences.

Curriculum data using the Curricular Component Form (Appendix A) was gathered from 26 CLS programs in the state including 15 education institutions offering the MT degree, 4 clinical MT programs, 6 MLT(AD) programs and 1 MLT(C) program.

Preprofessional Courses

The basic science and math preprofessional courses offered follow or exceed the accrediting agency essentials.

For four year institutions they include an average of 23 semester hours of biology, 20 semester hours of chemistry and 6 semester hours of math. MLT(AD) programs in four year universities have an average of 12 semester hours each in biology and chemistry and 4 semester hours of math. MLT(AD) programs in the UK-Community Colleges have fewer hours with 9 each in biology and chemistry and 3 in math. The MLT(AD) Proprietary Program requires 10 quarter hours of biology, 4 quarter hours of chemistry and 4 quarter hours of math. The one year MLT(C) program lists all courses as professional and does not award credit hours since it is a vocational technical school, but courses entitled Anatomy and Physiology and Introductory Chemistry are assumed to be basic sciences. One course each in biology and chemistry are required.

After studying courses currently offered and accrediting agency essentials, we would recommend for ease of vertical mobility that as a minimum the following courses be offered in the three CLS programs at levels which are transferable.

	BIOLOGY	CHEMISTRY	MATH
MLT(C)	Anat. & Phys. with lab	Gen. College Chem. with lab	College Level Math
MLT(AD)	Gen. Micro. with lab	A 2nd Gen. college Chem, with lab	
MT	Add Biol. courses to total at least 16 sem. hrs. including immunology and Gen. Biology with lab	Organic or Biochem. with lab and quant. with lab with min. of 16 sem. hrs. Chem.	College Level Math

If beginning students lack the necessary high school background to start with college level courses, remedial or preparatory courses would be needed in addition.

Students in MLT programs should be advised that some preprofessional courses offered at two year institutions do not meet the standards necessary for the four year MT degree. It is recognized that it is not always practical or possible to conduct courses in colleges in which there is little demand or interest. But the students need to be aware of whether courses will transfer, and should be given the chance to take college level courses when possible.

Clear and complete descriptions of all components of MT programs should be made available to MLT advisors and students so that students who are interested can prepare properly for articulation.

Professional Courses

In order to compare the professional curricula in the various levels of CLS programs, we decided to group the courses into seven categories.

The categories include:

1. Clinical Chemistry - Urinalysis
2. Hematology - Coagulation
3. Immunology - Immunohematology
4. Microbiology (includes Bacteriology, Mycology, Parasitology and Virology)
5. Management - Education
6. Professional Adjustment - Phlebotomy (includes orientation and introduction to professional responsibilities)
7. Other Combined Clinical Practicum (clinical practicum was reported as it pertained to specific categories when possible, but was included in this separate group if the specific discipline could not be identified.)

Comparison of credit hours was ruled out as impractical because they are not determined by a standard system in all CLS programs. Instead we chose to average clock hours of instruction in each of the seven categories. Although clock hours can be easily compared, they do not allow realistic comparison of course content or student competency, but simply represent time spent.

Figure 1 summarizes clock hour averages for the three types of CLS programs in the seven categories. Examination of the overall averages for the 4 year, 2 year and 1 year programs shows some obvious differences;

1. Management and Education are taught at the 4 year level only, which is to be expected.

2. Total clock hours in every category are greater in the 4 yr. programs than in the 2 yr. programs except for Professional-Adjustment-Phlebotomy. This may be explained partially by the fact that in some 4 yr. programs, orientation and introduction to professional responsibilities are included in the preprofessional component.

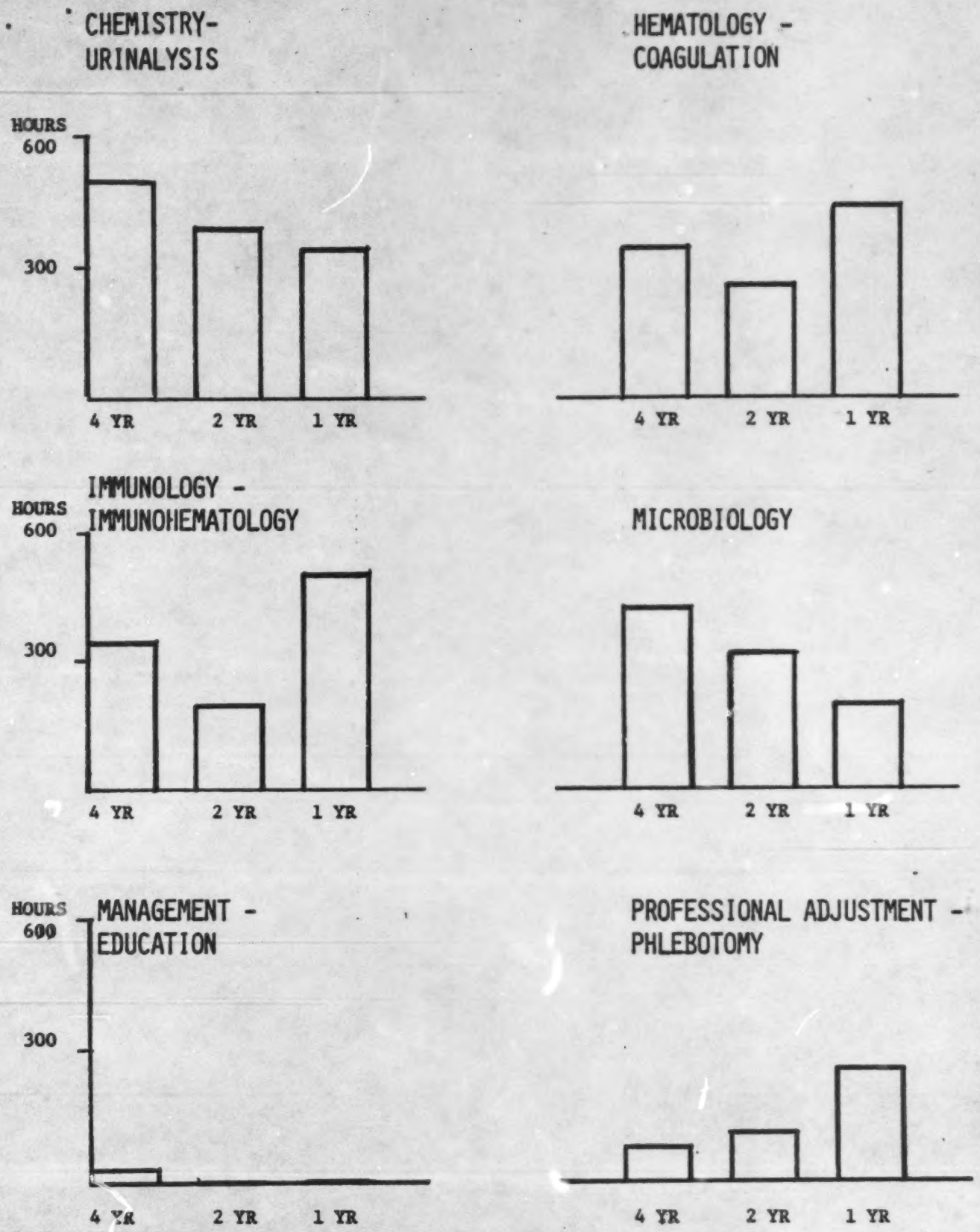

CHEMISTRY-
URINALYSIS
HOURS
600
300
4 YR
2 YR
1 YR
HEMATOLOGY -
COAGULATION
4 YR
2 YR
1 YR
IMMUNOLOGY -
IMMUNOHEMATOLOGY
HOURS
600
300
4 YR
2 YR
1 YR
MICROBIOLOGY
4 YR
2 YR
1 YR
HOURS
600
MANAGEMENT -
EDUCATION
300
4 YR
2 YR
1 YR
PROFESSIONAL ADJUSTMENT -
PHLEBOTOMY
4 YR
2 YR
1 YR
CLOCK HOUR AVERAGES

FIGURE 1

3. In 3 categories (Hematology-Coagulation, Immunology-Immunohematology and Professional-Adjustment-Phlebotomy), the 1 year program requires more time than either the 4 or 2 year programs. This probably reflects the lack of preprofessional preparation in the 1 year program which necessitates inclusion of general science information to supplement specific professional instruction.

Total clock hour averages for professional courses at the three levels are:

4 yr. program = 1749
2 yr. program = 1129
1 yr. program = 1771

The comparison of clock hours alone, can be misleading. For example, it would appear that the 2 yr. MLT needs only to complete the additional 620 clock hours to satisfy the professional requirements of the MT program.

But MT programs have been in existence much longer than MLT programs and were not originally structured to have an MLT base topped by additional advanced MT work. Instruction at the MT level assumes a strong background in the basic sciences and builds upon that knowledge, while the MLT who is not required to have as many basic science prerequisites is taught at a more practical level. This complicates articulation of the two levels of programs and requires a restructuring of MT professional curricula in programs attempting articulation efforts.

Our recommendations concerning articulation aspects of the professional courses are the following:

The DAG prepared competency statements and objectives for basic and advanced levels of CLS education which were subsequently

validated by clinical practitioners. Programs interested in becoming more effectively involved in articulation could attempt to utilize the competencies and objectives. They could be defined more specifically if necessary and would, of course, required modification as changes occur. MLT program faculty could attempt to design their courses upon the basic level competencies and MT programs could design two levels of courses, the basic and advanced, in each specific professional discipline. MLT graduates from programs which have designed their courses based upon the accepted basic level of competencies would be prepared to start MT programs at the advanced level.

Another approach is to develop curricula into modules with progressively increasing emphasis upon more advanced course work. If this were done in self instructional packages, the MLT students could identify for themselves the point at which they need to begin the MT work.

A third possibility is for MT instructors to individualize a program, planned according to the specific needs of students after analyzing check lists or evaluating competencies.

Attempts at some of these revisions have already been made in the state. They require a complete restructuring of courses and an adequate number of faculty and facilities. It should be understood that not every program has the kind of support required for the work involved.

Table 1 outlines the model curriculum which allows for articulation of the three levels of CLS programs.

TABLE 1.
MODEL ARTICULATED CURRICULUM

MT	ADDITIONAL BIOLOGY COURSES (TO TOTAL MINIMUM OF 16 SEM. HRS.) IMMUNOLOGY (MAY BE COMBINED WITH ANOTHER COURSE) GENERAL BIOLOGY WITH LAB	ORGANIC BIOCHEMISTRY WITH LAB (TOTAL SEM. HRS. = MINIMUM OF 16) QUANTITATIVE CHEMISTRY WITH LAB	COLLEGE LEVEL MATH	ADVANCED LEVEL BASED ON OBJECTIVES
MLT(AD)	GENERAL MICROBIOLOGY WITH LAB	GENERAL COLLEGE CHEMISTRY WITH LAB (2ND COURSE)		BASIC LEVEL BASED ON OBJECTIVES
MLT(C)	ANATOMY & PHYSIOLOGY WITH LAB	GENERAL COLLEGE CHEMISTRY WITH LAB	COLLEGE LEVEL MATH	BASIC LEVEL BASED ON OBJECTIVES
	BIOLOGY	CHEMISTRY	MATH	PROFESSIONAL COURSES

APPENDIX A

CURRICULAR COMPONENT FORM

PRE-PROFESSIONAL COURSES * Course # and Name (Attach outline for each course)	Clock Hours Required	Credit Hours Awarded: Indicate both Number and Type of hours (Quarter or Semester)	Teaching Methodology: Estimate the percentage of time spent in the following teaching/learning modes: Lecture %	Lab %	Clinical** %	Total 100%	Indicate Minimal Grade (i.e. B,C) or Competency Level (i.e. 75%) acceptable for this course Grade	Comp.Lev.	What are the limitations in the sequencing of this course with regard to the rest of the curriculum?	Major topics covered and Comments

*"Pre-professional Courses" are defined as science & math prerequisites necessary prior to enrollment in core professional courses.

**"Clinical" is defined as teaching/learning that occurs in a simulated and/or in an actual health care delivery setting.

CURRICULAR COMPONENT FORM

Professional Courses (Attach outline for each course)	Clock Hours Required	Credit Hours Awarded: Indicate both Number and Type of hours (Quarter or Semester)	Teaching Methodology: Estimate the percentage of time spent in the following teaching/learning modes: Lecture %	Lab %	Clinical** %	Total 100%	Indicate Minimal Grade (i.e. B,C) or Competency Level (i.e. 75%) acceptable for this course Grade	Comp.Lev.	What are the limitations in the sequencing of this course with regard to the rest of the curriculum?	Major topics covered and Comments

**"Clinical" is defined as teaching/learning that occurs in a simulated and/or in an actual health care delivery setting.

LINICAL AFFILIATION DATA

Does your program provide Clinical Affiliations for your students? YES ☐ NO ☐
If "YES" please complete the remainder of this form.

AFFILIATE	Please check the type(s) of Affiliation Agreements** in the appropriate columns				How much of the Student's total clinical experience does this affiliation account for? (In percent)	Are students given specific Learning Objectives for this Clinical site?	COMMENTS
	Gentlemen's Agreement	Business Letter	Memorandum of Agreement	Contract			
me: _____ ation: _____					_____ %	YES ☐ NO ☐	
me: _____ ation: _____					_____ %	YES ☐ NO ☐	
me: _____ ation: _____					_____ %	YES ☐ NO ☐	
me: _____ ation: _____					_____ %	YES ☐ NO ☐	
me: _____ ation: _____					_____ %	YES ☐ NO ☐	

**Refer to attached clinical affiliation definitions, p. 4.

I. Clinical Affiliation Definitions

Gentlemen's Agreement: The "gentlemen's agreement" is a verbal agreement which develops from conversations, correspondence and visits between the parties.	Business Letter: A letter documenting the existence of a clinical education experience. It is often very brief, and leaves many areas of mutual concern unaddressed.	Memorandum of Agreement: This agreement is often a carefully prepared document arranged in sections by topical headings and written in either legal or lay language. It is frequently developed without legal counsel.	Contract: This is the most formal type of affiliation agreement. Usually developed with the aid of attorneys, the contract is often written in legal language and is usually very complete.

II. List or attach the recommended curriculum by year. (See attached form for an example.)

ARTICULATION AND ARTICULATION MODEL

The Articulation Subcommittee dealt with articulation, a puzzle the DAG has worked to solve which still has pieces missing, and the articulation model. It was determined that data gathered by the other subcommittees would be usable, and another questionnaire would not be necessary. However, when an opportunity emerged to get input from the University of Kentucky (UK) Community College System MLT Program Directors, the subcommittee recognized a way to gain insight into the perceptions of faculty who worked closely with prospective consumers of articulated programs, and generated discussion questions. Written response for the same questions was requested of non-UK affiliated MLT program directors.

In addition, DAG members representing four-year institutions were asked to determine the transferability and applicability of specific courses in different MLT curricula to their respective four-year programs.

The Results

MLT program directors discussed or responded to ten questions about articulation. The responses will reflect the questions.

The consensus was that the responsibility for articulation rests with both two and four-year institutions. A major problem was the lack of communication between faculties which allowed misconceptions of the role and purpose of the two-year institutions.

Although some students went through MT programs, either in Kentucky or out-of-state, alternate methods were used for career laddering such as baccalaureate degree, and work experience, HEW or AMT certification.

Two years and a maximum of two-and-one-half years was considered reasonable time to earn the MT degree after completing the MLT curriculum.

MLT(ASCP) certification or graduation from an accredited program should indicate competency, but there was some support for the need for performance testing.

Difference in performance of the MT and MLT at career entry was perceived to be in the area of knowledge, not skill.

In working toward the MT degree, the MLT clinical experience should count and could be supplemented with problem solving and special procedures.

The beginning and advanced program structure was identified as the most practical format for articulated programs.

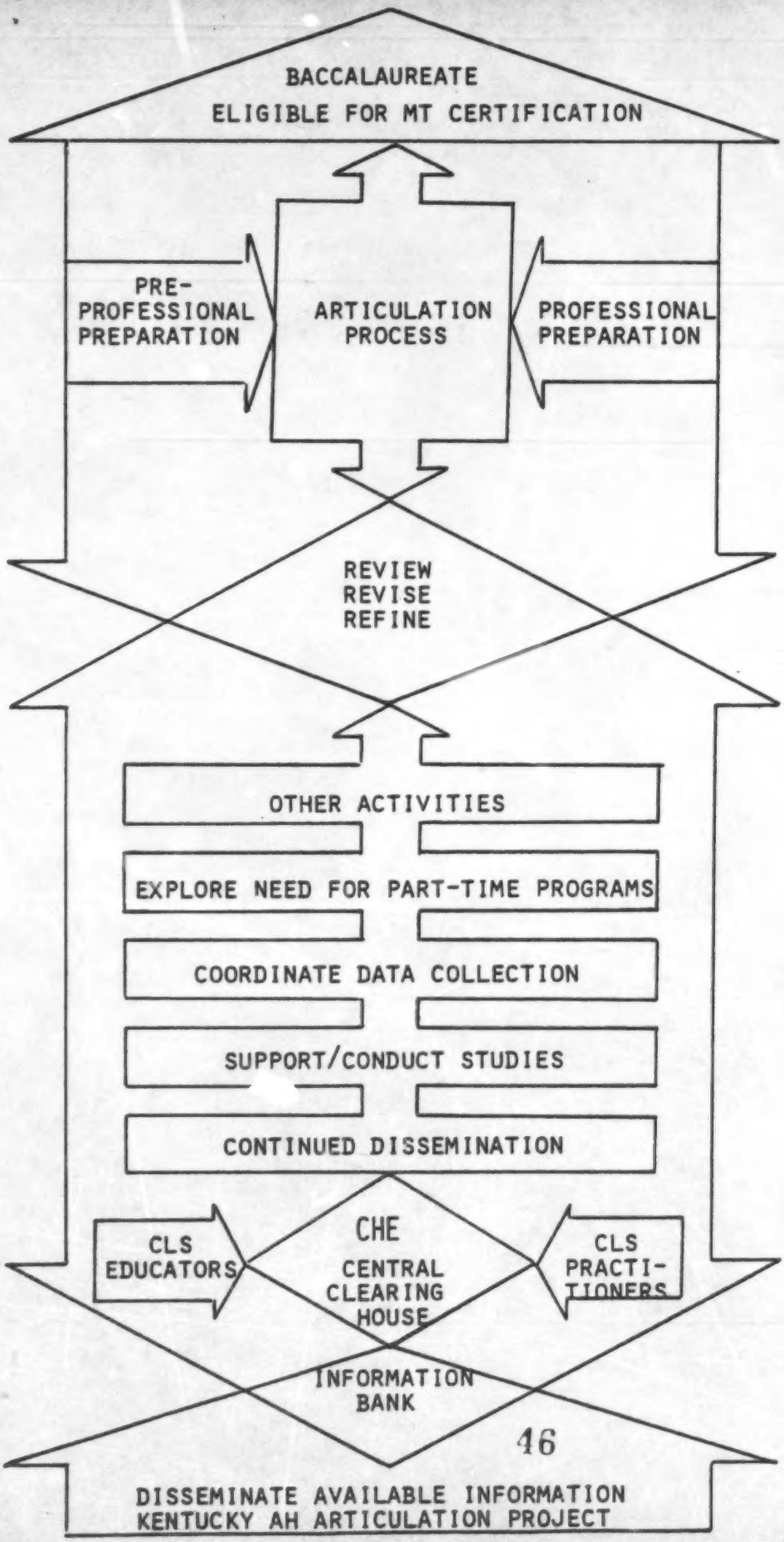
In examining the transferability and applicability of MLT curricula to four-year MT programs, average credit hours required to complete the four-year degree ranged from 42 to 86 in addition to the clinical practicum and professional curriculum. Also, differences within institutions occurred depending on the MLT programs from which a student might transfer. Reasons for the differences were attributed to (1) the methods used to specify course content -- the contrast between catch-all course titles, such as Laboratory Techniques, which covered extensive material, and clear-cut titles, such as Hematology that reflect specific course content, (2) institutional residency requirements -- the minimum number of credits a transfer student needs to complete at the degree-granting institution, and (3) institutional policies that put a ceiling on the number of transfer credits that can be accepted by the degree-granting institution.

The Recommendations

The recommendations of the study, to some extent, are the basis of the three phase articulation model. The study indicated a need for communication. Phase I, the Immediate Phase, is founded on the data collected for the Kentucky Articulation Project. During this phase an information bank would be established and available, useful articulation information would be disseminated. Phase II, the Transitional Phase, revolves around the establishing of a central clearing house which would be situated, supported, and implemented by the Kentucky Council on Higher Education (CHE) with input from and involvement with CLS educators and practitioners. The function of the clearing house would be to update and maintain the information bank, continue dissemination of information, and coordinate articulation-stimulating activities such as conducting future studies, exploring part-time programs and developing competency testing. The outcomes of these activities would be utilized in Phase III, the Articulation and Maintenance Phase.

Problems, constraints, and barriers uncovered during Phase III would stimulate continued activities in Phase II which would be carried back, eventually, to Phase III. In addition, evaluation of the articulation process during this phase would be revised and refined, leading to effective, efficient laddering possibilities which would optimally benefit students.

The general direction of the model is upward or positive. It is expected that movement between phases will be continuous and that the entire articulation process will be dynamic, continually progressing in a positive direction.


BACCALAUREATE
ELIGIBLE FOR MT CERTIFICATION
PRE-
PROFESSIONAL
PREPARATION
ARTICULATION
PROCESS
PROFESSIONAL
PREPARATION
PHASE 3
ARTICULATION
AND
MAINTENANCE
REVIEW
REVISE
REFINE
OTHER ACTIVITIES
EXPLORE NEED FOR PART-TIME PROGRAMS
COORDINATE DATA COLLECTION
SUPPORT/CONDUCT STUDIES
CONTINUED DISSEMINATION
PHASE 2
TRANSITIONAL
CLS
EDUCATORS
CHE
CENTRAL
CLEARING
HOUSE
CLS
PRACTI-
TIONERS
INFORMATION
BANK
DISSEMINATE AVAILABLE INFORMATION
KENTUCKY AH ARTICULATION PROJECT
PHASE 1
IMMEDIATE